Having thus described the invention, it is now claimed:

1. A hybrid device comprising:

a substrate;

a micro-spring interconnect formed on the substrate, the micro-spring interconnect including,

an elastic material that is initially fixed to a surface on the substrate including,

an anchor portion fixed to the substrate, and

a free portion; and

a sensor formed on the substrate, the sensor including an active layer and contacts, said active layer being capable of sensing light,

said micro-spring interconnect and said sensor being integrated on the substrate.

2. The invention according to claim 1 wherein the hybrid device further includes at least one of a single light source, an array of lasers, and an array of light emitting diodes (LEDs), positioned to emit light at least partially through a portion of the sensor.

3. The invention according to claim 2 wherein the sensor is designed and aligned with at least one of the laser array and the LED array, to receive emitted light from at least one of, some of the lasers of the laser array and some of the LEDs of the LED array.

4. The invention according to claim 2 wherein the sensor is designed and aligned with at least one of the laser array and the LED array to receive emitted light from a portion of at least one of the laser array and the LED array.

5. The invention according to claim 4 wherein the substrate is designed and aligned with at least one of the laser array and the LED array to receive emitted light from a portion of at least one of the laser array and the LED array.

6. The invention according to claim 1 wherein the sensor is an array of sensors.

7. The invention according to claim 1 wherein the substrate and the active layer of the sensor at least partially transparent at selective wavelengths.

8. The invention according to claim 1 wherein the sensor and the micro-spring interconnect are comprised of materials which allow for integration of the micro-spring interconnect and the sensor on the single substrate during a manufacturing process, wherein at least one of the materials for the micro-spring interconnect and the sensor is the same.

9. The invention according to claim 1 wherein the sensor is comprised of,

a first transparent/conductive layer;

an active layer on top of the first transparent/conductive layer;

a second transparent/conductive layer on top of the active layer;

a passivation/release layer located over at least the first transparent/conductive layer and the second transparent/conductive layer;

vias through the passivation/release layer to the first and second transparent/conductive layers; and

a metal layer connecting to the first and second transparent/conductive layers through the vias, wherein the metal layer acts as signal lines to receive and carry signals from the active layer.

10. The invention according to claim 9 wherein the elastic material fixed to the substrate is held by the passivation/release layer, which is interposed between the substrate and the elastic material.

11. The invention according to claim 10 wherein the elastic material is a stressed metal layer having sub-layers of differing stress gradients, whereby when released from the passivation/release layer, the released portion moves out of a plane of the substrate.

12. The invention according to claim 1 wherein the sensor further includes an absorption layer, located immediately over the sensor, wherein the absorption layer absorbs unwanted light prior to being detected by the active layer.

13. The invention according to claim 9, wherein the active layer is a three layer element, wherein a first layer is a n+doped amorphous silicon, the first layer being one of, but not limited to n+ phosphorous–doped amorphous silicon and n+arsenic-doped silicon;

wherein a second layer is an intrinsic amorphous silicon;

wherein a third layer is a p+doped amorphous silicon, the third layer being, but not limited to, p+boron-doped amorphous silicon.

14. The invention according to claim 1 wherein a switch is located, between the sensor and the substrate, such that the sensor is an active semi-continuous sensor.

15. The invention according to claim 14 wherein the switch is a thin-film-transistor (TFT).

16. The invention according to claim 1 wherein the micro-spring interconnect is a plurality of micro-spring interconnects.

17. A hybrid device comprising:

at least one of a laser or LED device capable of emitting light at a certain wavelength;

a substrate;

a micro-spring interconnect formed on the substrate the micro-spring interconnect including,

an elastic material that is initially fixed to the substrate,

an anchor portion fixed to the substrate, and a free portion; and

a sensor formed on the substrate, in an integrated manner, with the micro-spring interconnect, the sensor including an active layer and contacts, wherein said substrate, and said sensor are at least partially transparent to light at the wavelength emitted by at least one of the laser or the LED device; and

said at least one of the laser or the LED device and said substrate with said sensor and said at least one micro-spring interconnect being separately fabricated and aligned, such that at least a portion of the light emitted by the at least one of the laser and LED device is directed through at least a portion of the substrate and the sensor.

18. The invention according to claim 17, wherein at least a portion of the laser or the LED device is a plurality of lasers or LEDs formed in a laser or LED array.

19. The invention according to claim 17 wherein the sensor is sized such that each of the lasers or LEDs emit light at least partially through the sensor.

20. The invention according to claim 17 wherein the sensor is a plurality of sensors, sized such that a sub-group of the lasers or the LEDs may emit light through selected ones of the of sensors.

21. The invention according to claim 19 wherein the lasers or LEDs are arranged as a printbar, and the micro-spring interconnect is in electrical contact with the printbar.

22. A calibration/printing system comprising:

a sensor configuration including a sensor element integrated on a substrate with a plurality of micro-spring interconnects;

a light source aligned with the sensor configuration such that at least a portion of the light from the light source is sensed by the sensor and at least a first of

the micro-spring interconnects is in physical contact with a portion of the light source;

a driver chip aligned with the sensor configuration and the light source such that at least a second of the micro-spring interconnects is in physical contact with a portion of the driver chip, whereby a communication path is formed between the light source and the driver chip by the at least first and second micro-spring interconnects.

23. The invention according to claim 22 wherein the driver chip further includes:

a comparator for comparing a sensor readout current from the sensor and a reference current;

a converter arrangement which converts the output of the comparator into digital data representing characteristics of the light source;

a set of low frequency shift registers configured to receive and store the digital data;

an activation signal selectively supplied to the light source to selectively emit light therefrom;

a driver designed to interpret the digital data as activation signal correction information for the activation signal;

a high frequency shift-register configured to receive and store digital image data from a source external to the driver chip; and

an enable/disable output from the high frequency shift-register to selectively supply the activation signal and light source correction information to the light source, whereby an amount of light emitted by the light source is controlled.

24. The invention according to claim 22 wherein the digital image data from the source external to the driver chip is supplied as high frequency bit stream data.

25. The invention according to claim 22 wherein the light source is a printbar having an array of light sources, and wherein the printbar is controlled to activate the light sources in a sequential manner to obtain calibration data to be stored in the driver.

26. A hybrid device comprising:

a micro-spring interconnect structure; and

at least two devices electrically connected by the interconnect structure wherein,

one of the devices is a sensor, the sensor including an active layer and contacts, said active layer being capable of sensing light, and

another one of the devices is at least one of a single light source, an array of lasers, and an array of light emitting diodes (LEDs), positioned to emit light at least partially through the sensor.

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